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senting the different natural orders, together with outlines of a few common myriopods and arachnids. The cockroach, in the opinion of many teachers, would furnish a more satisfactory paradigm of insect structure than the grasshopper. At any rate, the work would gain by including a full outline of both insects. The chapter on the mouth-parts should have been extended to include outlines of the alimentary tracts of several different insects and of some one holometabolic insect in its different instars. Good dissections of the alimentary tract are easily made by the beginner and are eminently instructive both anatomically and physiologically. The same is true of the reproductive organs of insects. While these additions would considerably increase the size of the book, they would also increase the opportunities for selection on the part of the teacher and student. "*Wer Vieles bringt, wird Manchem Etwas bringen*" is as true of insect anatomy as of any other extensive subject.

The chapter on the structure and venation of wings is excellent, as would be expected from the authors' valuable researches on these organs. This and the chapter on the mouth-parts are the only portions of the book in which the principles of comparison, which redeem the sterility of anatomical details, are really accentuated. The former chapter is also the only one that is at all adequately illustrated with clear, simple figures. The concluding chapter on histological methods is also excellent and will be useful to the student in other fields of animal morphology. One notes with pleasure that there are still investigators bold enough to prefer the cumbersome but accurate sliding microtomes to the unreliable rotatory machines of our laboratories. The authors have unfortunately omitted more than a mere reference to the celloidin method, which deserves much more attention in insect histology than it has received.

The outlines exhibit few inaccuracies in detail, and perhaps none as flagrant as those which characterize the table of correspondences between the male and female reproductive organs on p. 46. The seminal vesicles do not correspond, morphologically at least, to the

egg calyces, and it is quite erroneous to describe the ejaculatory duct as 'the united vasa deferentia' and the vagina as 'the united oviducts.' The penis, moreover, is neither analogous nor homologous to the ovipositor, and it is difficult to see why these organs should be made to correspond to each other.

It is greatly to be regretted that the clear and straightforward English of the authors should be marred in this, as in the previous editions, by a belated propaganda for an anatomical nomenclature as inelegant as it is unnecessary. The increasing reluctance of American zoologists to use terms like 'proximal,' 'distal,' 'mesal,' etc., is significant and should have been heeded by the authors. The instructor is certainly to be commended who compels his students to translate all these university provincialisms into normal English before beginning to use the otherwise admirable outlines.

The typography, paper and especially the binding are all that can be desired in a laboratory guide.

W. M. WHEELER.

*Neudrucke von Schriften und Karten über Meteorologie und Erdmagnetismus herausgegeben von Professor DR. G. HELLMANN.* No. 14. *Meteorologische Optik.* Berlin, A. Asher and Co. 1902. 4to. Pp. xiv+107.

This, the latest and probably the last of the reprints of rare meteorological and magnetic memoirs to be published by Dr. Hellmann, treats of a subject that has not been considered before in the series and, since optical phenomena were among the earliest to be observed, the present memoirs extend over the long period from 1000 to 1836. The special subjects comprise first, four important memoirs on the rainbow, namely, by Theodoricus Teutonicus (1311), Descartes (1637), Newton (1704) and Airy (1836); two descriptions of the Brocken spectre and the white fog-bow by Ulloa and Bouguer (1744-48); three papers on halos, namely, descriptions of remarkable phenomena of this kind seen by Hevelius in Danzig (1672) and by Lowitz in St. Petersburg (1794), besides the fundamental essay of Fraunhofer (1825) on the formation of colored

coronæ. There follow a memoir on mirages by Monge (1797) and an account by Scoresby (1820) of some remarkable atmospheric reflections and refractions in the Greenland Sea; the earliest discussion of twilight by Alhazen (about 1000) and the first good account of the anti-twilight arch by Mairan (1753). The volume contains several illustrations, which like some of the text are in facsimile, and is enriched with the usual historical and explanatory notes. Dr. Hellmann's work is always so exact that it is a surprise to find slight typographical errors on page 83 in the reprint of Scoresby's paper. Like its predecessors, the present volume is published with the aid of the German Meteorological Society, which has fixed the price at 11 marks (\$2.75), and although it is not on sale in this country, two or three copies may be purchased at the above price from the Blue Hill Observatory, Hyde Park, Mass. Before closing my reviews of these reprints of rare papers, it should be mentioned that already several of the preceding thirteen numbers are out of print, which shows that Dr. Hellmann's enterprise has been quickly appreciated by librarians and private collectors of historic documents.

A. LAWRENCE ROTCH.

#### SCIENTIFIC JOURNALS AND ARTICLES.

*Bird Lore* for July-August opens with an entertaining article 'Concerning the Bad Repute of Whiskey John' by Fannie Hardy Eckstorm, and this is followed by some well illustrated 'Nighthawk Notes' by George H. Selleck. Ernest Crosby contributes a poem on 'The Veery's Note' and John Hutchins describes in some detail 'The Nesting of the Yellow-Throated Vireo.' Edith M. Thomas commemorates in verse the destructiveness of 'The Sapsucker,' and the instalment of 'How to Name the Birds' is devoted to the vireos, warblers and pipits. The reviews and reports of societies are of interest, as is also the editorial on nomenclature.

*The Plant World* for July contains 'Through Desert and Mountain in Southern California' by S. B. Parish, 'The Protection of Native

Plants' by Idelette Carpenter and 'Plants used for Cuban Confectionery' by Charles Louis Pollard. In the supplement devoted to the Families of Flowering Plants Mr. Pollard continues the descriptions of the families of the Polemoniales.

*The Museums Journal* of Great Britain begins its second year with the July number. The Report of the Council of the Museums Association states that the publication of the *Journal* has been in every way a success and that it will soon begin the publication of a Directory of Museums as a Supplement. The first instalment will probably be in the August number. The leading article is the address of the president of the Museums Association, Mr. W. E. B. Priestly. There is a description of a museum microscope which has just been placed on the market by Messrs. W. Watson and Sons. As now arranged this instrument is limited to 12 slides, but we see no reason why it could not be so modified as to take slides placed on an endless belt after the method devised by Dr. J. M. Flint and used in the Army Medical Museum. There is a too brief account of the opening of the very interesting War and Peace Museum at Lucerne, designed to illustrate the history and horrors of warfare with a view to aiding in its abolishment.

*The American Naturalist* for August contains a description, in some detail, of 'The Anatomy of a Double Calf' by H. L. Osborn, an account of 'The Metamorphosis of *Sisyr*' by Maude H. Anthony, which contains as well many details of the anatomy of the larva and of wing variation in the adult. Henrietta F. Thacher describes 'The Regeneration of the Pharynx in *Planaria maculata*,' and William A. Hilton 'A Structural Feature connected with the Mating of *Diemyctylus viridescens*,' these being the small pits on the sides of the neck. These are much larger in the male than in the female and their secretion is thought to attract the female and cause her to follow the male after mating. C. R. Eastman gives 'Some Hitherto Unpublished Observations of Orestes St. John on Palæozoic Fishes' and S. N. Rhoads presents some observations on 'The